

positioning and shape of the shaft 310 are selected to restrict rotation and translation of the display 110 attached thereto. For instance, when the shaft 310 is situated in a “length-wise” orientation as shown, translation of the coupling member 300 is precluded because a first side 316 of the shaft 310, perpendicular to a translation path, exceeds the width of the channel portion 422.

As further shown in FIG. 7, the cross-sectional shape of the shaft 310 along with the shape of the perimeter edge 426 enable counter-clockwise (CCW) rotation of the shaft 310 by approximately ninety degrees (90°). However, any rotation well beyond ninety degrees is precluded since the first side 316 of the shaft 310 would come into contact with the perimeter edge 428. Similarly, the cross-sectional shape of the shaft 310 discourages CW rotation of the display 110 when the electronic device 100 placed in the TABLET position.

Referring now to FIG. 8, an exemplary embodiment of multiple layers of the interconnect area 440 within the body case 120 is shown. The interconnect area 440 features a slot 450 configured within the second body 140. The slot 450 has a depth less than the length of the shaft 310 of the coupling member 300. As a result, the shaft 310 protrudes from the second opening 420 of the body case 120. The slot 450 is configured not only to retain the securing element 330 within the body case 120, but also to permit translation of the securing element 330.

Referring now to FIG. 9, a cross-sectional view of the electronic device 100 of FIG. 7 along a cross-sectional line A—A is shown. Herein, the fastening element 320 of the coupling member 300 is inserted into the socket 340 and coupled to the display 110. Therefore, any rotation or translation of the coupling member 300 causes corresponding rotation or translation of the display 110.

As shown, the second opening 420 constitutes an opening for the slot 450 configured to enable rotation and translation of the coupling member 300. According to one embodiment of the invention, the slot 450 comprises a first retention element 500 situated at a first end 510 of the slot 410. The first retention element 500 provides a recess 520.

When the electronic device 100 is placed in the TABLET position, the securing element 330 is partially inserted into the recess 520. The recess 520 is sized so that the first retention element 500 applies downward forces against the securing element 330. As a result, the coupling member 300 is maintained in this position even during rotation of the display 110. The securing element 330 is disengaged from the recess 520 only when lateral forces are applied to translate the display 110.

As shown, the slot 450 further comprises a second retention element 530 situated at a second end 540 of the slot 450. The second retention element 530 is generally identical in construction to the first retention element 500 and provides a recess 550 sized to receive the securing element 330 of the coupling member 300.

As shown in FIG. 10, a cross-sectional view of the slot 450, positioned within the second body 140 of FIG. 9, along a cross-sectional line B—B is shown. Two flanges 560 and 570 may be attached to sidewalls 580 of the slot 450. These flanges 560 and 570 extend inward toward each other so that the distance (d1) between flanges 560 and 570 is wider than any side of the shaft 310, most notably a cross-sectional length of the shaft 310. The distance (d2) between sidewalls 580 of the slot 310 is of sufficient length to allow rotation of the securing element 330, but prevents unwanted lateral movement (i.e., rocking) of the coupling member 300.

II. Modes of Operation

FIGS. 11–16 illustrate exemplary embodiments of the electronic device 100 being transformed from use as a tablet PC to a portable computer. This is accomplished through rotation and translation of the display 110 as described below.

Referring now to FIG. 11, an exemplary embodiment of the electronic device 100 placed in a TABLET position is shown. Herein, the display 110 is mounted on the body case 120 via the coupling member and covers almost the entire body case 120, excluding the pointing device 200 placed on the raised area 133 of the first body 130 and the camera 170 along the end 146 of the second body 140.

Herein, software is deployed within the electronic device 100 to detect when the electronic device 100 is in the TABLET position (i.e., the display 110 is placed in a portrait orientation). When this position is detected, the software allows input data from either a writing instrument on the flat panel display 112 or a camera 170. No input data from the keyboard is accepted. However, when the electronic device 100 is placed into the FREE-STANDING position (i.e., the display 110 is horizontally rotated and translated), the software allows input data from either the keyboard 210 or the camera 170. No stylus input is accepted. This further improves operability of the electronic device 100.

As shown in FIG. 12, the display 110 is horizontally rotated. Herein, the keyboard 210, integrated into the first body 130, is partially exposed. In addition, more surface area of the second body 140 is exposed, while the first and second openings 400 and 420 still remain covered by the display 110.

Referring now to FIG. 13, an overhead view of an exemplary embodiment of the electronic device 100 placed in an INTERMEDIARY position is shown. Herein, the display 110 is now substantially centered over the body case 120 and continues to cover the hinge 150, which precludes vertical rotation of the second body 140. However, a portion of the keyboard 210 is visible. In general, the display 110 covers approximately fifty percent of the footprint for each body of the body case 120.

After rotation of the display 110 by approximately ninety degrees (90°) in the CCW direction, the display interconnect 430 has moved along the first perimeter edge 402 of the first opening 400 from the first retention area 410 to the second retention area 412.

In addition, the coupling member has been rotated by ninety degrees (90°) in the CCW direction, but still remains in the expanded portion 424 of the second opening 420. In particular, the shaft 310 is rotated accordingly, and therefore, is now situated in a “width-wise” orientation where none of the sides of the shaft 310 that are perpendicular to the linear channel portion 422 exceed the width of the channel portion 422.

Referring to FIG. 14, a cross-sectional view of the electronic device of FIG. 13 along a cross-sectional line A—A is shown. Herein, the securing element 330 is rotated, but is still retained within the recess 520 formed by the retention element 500.

Referring to FIG. 15, an exemplary embodiment of the electronic device 100 placed into the FREE-STANDING position is shown. In general, the display 110 is adjusted by moving the coupling member along the channel portion 422 of the second opening 420. As a result, the display 110 is positioned to clear the hinge 150 and exposes the entire first body 130, including the pointing device 200 and keyboard 210. This enables the second body 140, along with the